National Heritage Science Forum

Briefing note for consultation on a new National Heritage Science Strategy: 2018-2023

In 2010 the National Heritage Science Strategy (NHSS) was produced to address the findings of the 2006 House of Lords Science and Technology inquiry into Science and Heritage[1]. The inquiry found that the sector was fragmented and under-valued and recommended that the "heritage sector should come together in developing a broad-based national strategy for heritage science".

Why a new Strategy?

Seven years have passed since the strategy was published and it is time to move with the times, to take stock of what the heritage industry has achieved, what has yet to be done, and what new opportunities and challenges will arise.

There have been significant changes in the environment in which heritage science operates, not least, political and funding structures. Key drivers for a refresh of the strategy include:

- The establishment of UK Research and Innovation, and associated changes within the Research Councils
- The Government's Industrial Strategy and the need to be explicit about the role of heritage science in economic growth, research and innovation, skills development, and the country's productivity.
- Brexit and how to maintain the UK's standing in the world by creating, retaining and spreading value through leadership in skills and expertise, collaborative research, funding, infrastructure and goods and services.
- The publication by the UK Government of the Culture White Paper and the Digital Strategy.
- The publication of the Arts & Humanities Research Council (AHRC) heritage strategy.
- The launch of the European Research Infrastructure for Heritage Science, and its UK hub.
- The Mendoza review and the review of DCMS-sponsored museums.

Refreshing the 2010 strategy provides the opportunity to review its objectives and action areas in the light of achievements to date, and to incorporate new areas that are important to the country and to the heritage industry. It is also an opportunity to align the strategy to national initiatives, such as the Government's Industrial Strategy, and communicate the goals of the heritage science community more widely.

Vision

The 2010 strategy set out the vision of the heritage sector for heritage science. For 2018-2023 this is updated to make it clear that it applies to both tangible and intangible cultural heritage, and that the benefits are to society and to the economy.

The understanding and preservation of the UK's extraordinarily rich and varied material, digital and intangible cultural heritage is enhanced by better use of science and technology. Heritage science is a robust, internationally recognised, well coordinated, vibrant and sustainable community that tackles some of the big challenges confronting humanity by understanding and addressing the present needs and future requirements of cultural heritage and delivering benefit to society and to the economy.

[1] House of Lords Science and Technology inquiry into Science and Heritage
http://www.heritagescienceforum.org.uk/documents/HoL_inquiry_2005-6.pdf

A framework for delivery, 2018-2023

It is proposed that the 2018-2023 strategy positions heritage science within the broader UK heritage sector/industry and provides a framework for action that delivers benefit for society and the economy in line with the vision and aims.

The new Strategy will be used to:

- define outstanding research priorities
- secure investment
- strengthen links across the heritage industry and with other partners
- generate a supportive policy environment
- articulate the value of heritage science to society and the economy

As in 2010, the new National Heritage Science Strategy is a strategy for the heritage sector. It is envisaged that the main audiences for the Strategy are the heritage sector (comprising heritage organisations, academia, commercial organisations and third sector organisations) as users of the strategy and, opinion-formers, policy-makers, aligned sectors and partners as groups that the heritage sector will work with to deliver the Strategy. There is a strong commitment to benefit to society throughout the Strategy and the document will be available publicly, however, the document will inform the development of communications and activities with the wider public rather than be a tool for direct public engagement.

It is proposed that the new Strategy is themed around four areas in which heritage science delivers impact: research and innovation, the economy, skills, and quality of life. The strategy identifies desired outcomes for each area that build on existing strengths, but where action is needed to achieve the outcomes.

Outcomes for:

- ***Excellent research and innovation*** - A physical and digital infrastructure that ensures the UK's world-leading heritage science research and innovation takes place across the UK. Mechanisms that support the growth of specialist interdisciplinary research, together with accessible funding streams.

- ***Increased economic impact*** - Improved innovation and commercial exploitation of research as a result of academia, heritage and industry working together more effectively. Improvements to the translation of research into practice so that it is accessible to both large organisations and SMEs.

- ***Skills and knowledge development*** - Opportunities to develop heritage science skills and knowledge from school age onwards, resulting in a multi-skilled and diverse volunteer and workforce.

- ***Improved quality of life*** – Better use of heritage science's unique position at the intersection of the sciences, arts, and humanities to create opportunities for more people to be involved in an increasingly diverse range of interactions with heritage to improve physical and mental wellbeing, happiness and positive civic engagement.

The themes in detail

A robust UK heritage science sector delivers positive outcomes for public benefit. The four themes show where the sector can work with others, including government, to deliver excellent research and innovation, increased economic impact, improvements in skills development, and enhancements to people's quality of life.

Excellent research and innovation

The UK produces excellent heritage science research and this is a strength on which the Strategy will build. The Science and Heritage Programme[2] was an £8.1 million programme of investment from AHRC and EPSRC that ran between 2007 and 2014. It funded 48 projects, involving more than 300 researchers, 234 institutions and 50 industry partners both in the UK and overseas. The programme shows how academia, industry and heritage organisations are able to work together in innovative ways to combine knowledge and skills from many different disciplines to improve the understanding, preservation and enjoyment of cultural heritage.

The UK's success at collaborative working is not limited to the UK. UK organisations have partnered extensively in European research projects. Between 2008-2013 UK institutions led or participated in EU-funded projects for which an EU contribution of €4.88 million was received. From 2014 to April 2017, the EU Horizon 2020 programme has awarded €14.81 million to heritage science research in the UK.

The National Heritage Science Strategy seeks to build on the strength of UK interdisciplinary and collaborative working in the field of heritage science. The next five years are potentially challenging as the UK exits the European Union, especially in terms of funding streams. But there are opportunities.

UK Research and Innovation launches in April 2018, with "a focus on cross-cutting issues that are outside the core remits of current funding bodies, such as multi-and inter-disciplinary research"[3]. The heritage sector will need to develop strong and high-level relationships with UKRI and the Research Councils and make a clear case for the value of heritage science research so that the mechanisms that emerge to support interdisciplinary research work well for specialist areas, such as heritage science, alongside more dominant sectors such as space, life sciences and automotive. The cross-cutting approach should extend to Government so that Departments including DCMS, BEIS, DCLG, Department for Education, Department for Environment, Food and Rural Affairs all actively facilitate, through policy and regulation, the positive contribution of heritage to UK society and economy.

In addition to a supportive environment for heritage science research, excellent research and innovation needs excellent infrastructure. A better geographical distribution of physical research centres and digital infrastructure will help the heritage industry to address current and future major challenges including mass tourism, the protection of cultural property (and by extension humanitarian values), and climate change. The recently launched European Research Infrastructure for Heritage Science (E-RIHS)[4] and its UK hub will strengthen distributed physical research centres in Higher Education Institutions and Independent Research Organisations. Developments in instrumentation mean that access to physical infrastructure is increasingly mobile. This infrastructure must be developed as a long-term resource if the UK is to maximize its research and innovation potential. And infrastructure is not limited to physical infrastructure. A robust digital infrastructure is necessary to support knowledge exchange and to enable the discoverability, sharing and re-use of research so that it has maximum impact and relevance in terms of benefit to society and business.

We propose that the National Heritage Science Strategy focuses on outcomes of:

- a physical and digital infrastructure that ensures the UK's world-leading heritage science research and innovation takes place across the UK, and
- mechanisms that support the growth of specialist interdisciplinary research, together with accessible funding streams

to deliver excellent heritage science research and innovation in the UK.

[2] Science and Heritage Programme http://www.heritagescience.ac.uk/

[3] Government Office for Science, 2 February 2017, https://www.gov.uk/government/news/sir-mark-walport-will-lead-uk-research-and-innovation

[4] European Research Infrastructure for Heritage Science http://www.e-rihs.eu/

Increased economic impact

The heritage sector is sizeable and can justifiably be described as a 'heritage industry' that includes heritage organisations, service organisations (such as suppliers of goods and materials suppliers, insurance, conservation) and academia. Data from Historic England shows that the historic environment in England alone produces £11.9 billion of Gross Value Added (2% of national GVA) and employs 278,000 people (Heritage Counts: Heritage and the Economy 2017[5]). Furthermore, it has significant economic value to other sectors: heritage tourism generated £16.4 billion in spending by domestic and international visitors and repair and maintenance of historic buildings directly generated £9.6 billion in construction sector output (Heritage Counts 2017).

There is the potential to increase economic impact though. Industry challenge workshops, bringing together industry, academia and heritage organisations were held as part of research undertaken by Professor May Cassar during her AHRC-funded Impact Fellowship[6] in 2015, and by the National Heritage Science Forum as part of its work to refresh the National Heritage Science Forum in 2017[7].

Greater economic impact requires stronger relationships between the constituent parts of the heritage industry (heritage organisations, academia and commercial organisations), and stronger relationships with aligned sectors including tourism, construction and the creative industries. Existing networks rely on individual relationships; again, the UK hub of E-RIHS has the potential to grow research-business partnerships across the UK, understand the research needs of business and contribute to economic development across the UK.

There is a need for better discoverability of research and access to data to enable its re-use, uptake by business, and contribution to the economy. Improved understanding of the benefits of Open Access research and data are part of the solution, as is an effective digital infrastructure. But there is also demand for better mechanisms for translating research into practice. Traditional publishing and conference models for sharing heritage science research are limiting access to it. A translational research hub as exists in other areas of research, such as medicine[8], would help industry access research more easily so that it can be commercialized and used to improve policy and practice. The heritage industry includes a large number of SMEs for which access to research and developments that support innovation and increased productivity are particularly challenging.

We propose that the National Heritage Science Strategy focuses on delivering outcomes of:

- improved innovation and commercial exploitation of research as a result academia, heritage and industry working together more effectively, and
- improvements to the translation of research into practice so that it is accessible to both large organisations and SMEs

to deliver increased greater commercialisation of research, increased productivity and more even distribution of economic impact in the UK.

We also recognise that the sector needs to be better at capturing the economic impact of heritage science research.

[5] Heritage and the Economy 2017 https://content.historicengland.org.uk/content/heritagecounts/pub/2017/heritage-and-the-economy-2017.pdf

[6] Impact Fellowship funded by the Arts and Humanities Research Council and supported by the (then) Department of Business, Innovation and Skills http://www.heritagescience.ac.uk/Impact_Fellowship

[7] Link to NHSF workshop report when published

[8] For example, University of Cambridge Office for Translational Research, School of Clinical Medicine http://otr.medschl.cam.ac.uk/

Skills and knowledge development

The development of skills and knowledge in heritage science brings many benefits. Heritage science sits at the intersection of the sciences, humanities and arts. It is inter-disciplinary and multi-disciplinary. Not only does the development of heritage science skills and knowledge provide the capacity to undertake the research, management and interpretation of heritage assets in support of the heritage industry, but it also creates individuals with highly transferable knowledge and skills that can be widely applied to multiple contexts - making them highly employable.

Heritage science offers particular opportunities to address the shortage of STEM skills that is recognised by Government. Through its application of science to the non-science domain of heritage, heritage science presents a rare opportunity to engage people with science, and develop scientific skills, amongst those who might not otherwise be interested. Heritage science is also successful at engaging women in STEM subjects; a high proportion of the people working and volunteering in the heritage industry are female.

In line with the House of Commons Science & Technology Committee report to its inquiry 'Industrial Strategy: science and STEM skills'[9], we think that the development of heritage science skills and knowledge should take place from school age onwards. Research commissioned by Historic England 'Heritage Science Resources for the National Curriculum in England'[10] reviewed science programmes (physics, chemistry, biology) at key stages 3, 4 and 5 with a view to identifying topics and areas where Heritage Science could be used to deepen understanding, enhance knowledge, and form connections between the subjects being studied. It concluded *"work undertaken through this project to map heritage science concepts to curriculum topics reveals there are opportunities at all key stages (3 to 5) and across biology, chemistry and physics"*. These opportunities are under-developed at present and the heritage industry would benefit from exploring them more fully.

In terms of developing a career in heritage science, the multi-disciplinary nature of heritage science presents both opportunities and challenges. Currently, most people engaged in heritage science employment or research engage at postgraduate level. The diversity in undergraduate qualifications or work experience produces an innovative and inspiring skills pool, but anecdotal evidence suggests that the lack of technical knowledge combined with practical problem-solving skills presents problems for employability, or at least are skills that need to be developed.

In the UK we have world-leading and innovative postgraduate training opportunities in heritage science. The growth of Collaborative Doctoral Training programmes and Collaborative Doctoral Partnerships has done much to build the field's capacity. But 'heritage science' is seldom recognised as a career and so the very strength of being able to apply skills from other disciplines to heritage science applications leaves the field vulnerable to trained heritage scientists applying their skills in other domains. Earlier research (2009)[11] into capacity in the heritage science domain suggests an ageing workforce, although good labour market intelligence is lacking. Opportunities to develop heritage science skills before postgraduate level and in the workplace as well as the academic environment would help to attract and retain high calibre individuals through their career paths. Some workplace training opportunities exist, for example, through the Icon Internship Programme[12] but there are new opportunities available that the field should explore, such as Apprenticeships.

We propose that the National Heritage Science Strategy focuses on the outcome of:

- increased opportunities to develop heritage science skills and knowledge from school age onwards, resulting in a multi-skilled and diverse volunteer and workforce.

[9] https://publications.parliament.uk/pa/cm201617/cmselect/cmsctech/991/991.pdf

[10] Heritage Science Resources in the National Curriculum in England, Historic England, 2016 https://www.historicengland.org.uk/research/current/heritage-science/heritage-science-resources-for-the-national-curriculum/

[11] Understanding capacity in the heritage science sector http://www.heritagescienceforum.org.uk/documents/nhss_report_3_web.pdf

[12] Icon Internship Programme https://icon.org.uk/what-is-conservation/internships

We know that the heritage industry benefits from the mobility of labour across international boundaries, and heritage science is no exception. Actions relating to skills and knowledge development should seek to ensure maximum ease in the international mobility of students and the workforce.

Lastly, we recognise the enormous contribution of the volunteer workforce to the heritage industry. Heritage Counts (2016) reports that the Taking Part Survey found that there were over 615,500 historic environment volunteers in England in 2015/16. The opportunities to develop heritage science skills and knowledge should be available to volunteers as well as to the paid workforce.

Improved quality of life

There is an increasing body of research in support of the positive impact of heritage on health and well-being, as well as into the role that heritage plays in people's connection to place, cultural identity and sense of community.

Whilst these themes offer exciting research topics and potential for new research partnerships, perhaps more exciting are the opportunities for creating more ways for people to be involved in heritage science. Heritage science is the application of science and technology to cultural heritage to improve its understanding, management and enjoyment. How can the sector use its unique position at the intersection of the sciences, arts and humanities to create opportunities for more people to be involved in an increasingly diverse range of interactions with heritage, in ways that improve physical and mental wellbeing, happiness and positive civic engagement? Is there potential for 'citizen heritage scientists' so that more people can benefit from enhanced quality of life through their engagement with heritage?

We propose that the National Heritage Science Strategy focuses on the outcome of:

- Better use of heritage science's unique position at the intersection of the sciences, arts, and humanities to create opportunities for more people to be involved in an increasingly diverse range of interactions with heritage to improve physical and mental wellbeing, happiness and positive civic engagement.

Next steps

Once responses to the consultation have been received, and further evidence and examples of the impact of heritage science have been collected the National Heritage Science Forum will develop the final strategy. The Forum will seek the help of the sector to publicise the new Strategy and explore the creation of a joint action plan for delivery.

Please click this link to contribute to the online consultation, open until 20 April 2018.

Further information:
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